SEQUENCE LISTING

<110> CPRO-DLO
Agriculture and Agri-food Canada

<120> Use of the BNM3 Transcriptional Activator to Control Plant Embryogenesis and Regenerqation Processes

<130> 07-334064

<140>
<141>

<150> EP 99201745.9-2106
<151> 1999-06-02

<160> 14

<170> PatentIn Ver. 2.1

<210> 1
<211> 2014
<212> DNA
<213> Brassica napus

<400> 1
gttcatctct cttctttaag accaaaacct ttttctcctc ctcttcatgc atgaacccta 60
actaagttct tcttctttta ccttttacca agaactcgtt agatcactct ctgaactcaa 120
tgaataataa ctggttaggc ttttctctct ctccttatga acaaaatcac catcgtaagg 180
acgtctactc ttccaccacc acaaccgtcg tagatgtcgc cggagagtac tgttacgatc 240
cgaccgctgc ctccgatgag tcttcagcca tccaaacatc gtttccttct ccctttggtg 300
tcgtcgtcga tgctttcacc agagacaaca atagtcactc ccgagattgg gacatcaatg 360
gttgtgcatg caataacatc cacaacgatg agcaagatgg accaaagctt gagaatttcc 420
ttggccgcac caccacgatt tacaacacca acgaaaacgt tggagatgga agtggaagtg 480
gctgttatgg aggaggagac ggtggtggtg gctcactagg actttcgatg ataaagacat 540
ggctgagaaa tcaacccgtg gataatgttg ataatcaaga aaatggcaat gctgcaaaag 600
gcctgtccct ctcaatgaac tcatctactt cttgtgataa caacaacgac agcaataaca 660
acgttgttgc ccaagggaag actattgatg atagcgttga agctacaccg aagaaaacta 720
ttgagagttt tggacagagg acgtctatat accgcggtgt tacaaggcat cggtggacag 780
gaagatatga ggcacattta tgggataata gttgtaaaag agaaggccaa acgcgcaaag 840
gaagacaagt ttatttggga ggttatgaca aagaagaaaa agcagctagg gcttatgatt 900
tagccgcact caagtattgg ggaaccacca ctactactaa cttccccatg agcgaatatg 960
aaaaagaggt agaagagatg aagcacatga caaggcaaga gtatgttgcc tcactgcgca 1020
ggaaaagtag tggtttctct cgtggtgcat cgatttatcg tggagtaaca agacatcacc 1080
aacatggaag atggcaagct aggataggaa gagtcgccgg taacaaagac ctctacttgg 1140
gaacttttgg cacacaagaa gaagctgcag aggcatacga cattgcggcc atcaaattca 1200
gaggattaac cgcagtgact aacttcgaca tgaacagata caacgttaaa gcaatcctcg 1260
aaagccctag tcttcctatt ggtagcgccg caaaacgtct caaggaggct aaccgtccgg 1320
ttccaagtat gatgatgatc agtaataacg tttcagagag tgagaatagt gctagcggtt 1380
ggcaaaacgc tgcggttcag catcatcagg gagtagattt gagcttattg caccaacatc 1440
aagagaggta caatggttat tattacaatg gaggaaactt gtcttcggag agtgctaggg 1500
cttgtttcaa acaagaggat gatcaacacc atttcttgag caacacgcag agcctcatga 1560
ctaatatcga tcatcaaagt tctgtttcgg atgattcggt tactgtttgt ggaaatgttg 1620
ttggttatgg tggttatcaa ggatttgcag ccccggttaa ctgcgatgcc tacgctgcta 1680

```
gtgagtttga ttataacgca agaaaccatt attactttgc tcagcagcag cagacccagc 1740
agtcgccagg tggagatttt cccgcggcaa tgacgaataa tgttggctct aatatgtatt 1800
accatgggga aggtggtgga gaagttgctc caacatttac agtttggaac gacaattaga 1860
aaaaatagtt aaagatcttt agttatatgc gttgttgtgt gctggtgaac agtgtgatac 1920
tttgattatg ttttttttctt tctctttttc tttttcttgg ttaatttctt aagacttatt 1980
tttagtttcc attagttgga taaattttca gact                           2014
```

<210> 2
<211> 579
<212> PRT
<213> Brassica napus

<400> 2

```
Met Asn Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro Tyr Glu Gln Asn
  1               5                  10                  15

His His Arg Lys Asp Val Tyr Ser Ser Thr Thr Thr Thr Val Val Asp
             20                  25                  30

Val Ala Gly Glu Tyr Cys Tyr Asp Pro Thr Ala Ala Ser Asp Glu Ser
         35                  40                  45

Ser Ala Ile Gln Thr Ser Phe Pro Ser Pro Phe Gly Val Val Val Asp
     50                  55                  60

Ala Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn
 65                  70                  75                  80

Gly Cys Ala Cys Asn Asn Ile His Asn Asp Glu Gln Asp Gly Pro Lys
                 85                  90                  95

Leu Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu
            100                 105                 110

Asn Val Gly Asp Gly Ser Gly Ser Gly Cys Tyr Gly Gly Gly Asp Gly
        115                 120                 125

Gly Gly Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Arg Asn
    130                 135                 140

Gln Pro Val Asp Asn Val Asp Asn Gln Glu Asn Gly Asn Ala Ala Lys
145                 150                 155                 160

Gly Leu Ser Leu Ser Met Asn Ser Ser Thr Ser Cys Asp Asn Asn Asn
                165                 170                 175

Asp Ser Asn Asn Asn Val Val Ala Gln Gly Lys Thr Ile Asp Asp Ser
            180                 185                 190

Val Glu Ala Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr
        195                 200                 205

Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu
    210                 215                 220
```

Ala His Leu Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys
225 230 235 240

Gly Arg Gln Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala
245 250 255

Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Thr Thr Thr Thr
260 265 270

Thr Asn Phe Pro Met Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys
275 280 285

His Met Thr Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser
290 295 300

Gly Phe Ser Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His
305 310 315 320

Gln His Gly Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys
325 330 335

Asp Leu Tyr Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala
340 345 350

Tyr Asp Ile Ala Ala Ile Lys Phe Arg Gly Leu Thr Ala Val Thr Asn
355 360 365

Phe Asp Met Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser
370 375 380

Leu Pro Ile Gly Ser Ala Ala Lys Arg Leu Lys Glu Ala Asn Arg Pro
385 390 395 400

Val Pro Ser Met Met Met Ile Ser Asn Asn Val Ser Glu Ser Glu Asn
405 410 415

Ser Ala Ser Gly Trp Gln Asn Ala Ala Val Gln His His Gln Gly Val
420 425 430

Asp Leu Ser Leu Leu His Gln His Gln Glu Arg Tyr Asn Gly Tyr Tyr
435 440 445

Tyr Asn Gly Gly Asn Leu Ser Ser Glu Ser Ala Arg Ala Cys Phe Lys
450 455 460

Gln Glu Asp Asp Gln His His Phe Leu Ser Asn Thr Gln Ser Leu Met
465 470 475 480

Thr Asn Ile Asp His Gln Ser Ser Val Ser Asp Asp Ser Val Thr Val
485 490 495

Cys Gly Asn Val Val Gly Tyr Gly Gly Tyr Gln Gly Phe Ala Ala Pro
500 505 510

Val Asn Cys Asp Ala Tyr Ala Ala Ser Glu Phe Asp Tyr Asn Ala Arg

515 520 525

Asn His Tyr Tyr Phe Ala Gln Gln Gln Gln Thr Gln Gln Ser Pro Gly
530 535 540

Gly Asp Phe Pro Ala Ala Met Thr Asn Asn Val Gly Ser Asn Met Tyr
545 550 555 560

Tyr His Gly Glu Gly Gly Gly Glu Val Ala Pro Thr Phe Thr Val Trp
565 570 575

Asn Asp Asn

<210> 3
<211> 2011
<212> DNA
<213> Brassica napus

<400> 3
ttcttctttt accttttacc aagaactcgt tagatcattt tctgaactcg atgaataata 60
actggttagg cttttctctc tctccttatg aacaaaatca ccatcgtaag gacgtctgct 120
cttccaccac cacaaccgcc gtagatgtcg ccggagagta ctgttacgat ccgaccgctg 180
cctccgatga gtcttcagcc atccaaacat cgtttccttc tccctttggt gtcgtcctcg 240
atgctttcac cagagacaac aatagtcact cccgagattg ggacatcaat ggtagtgcat 300
gtaataacat ccacaatgat gagcaagatg gaccaaaact tgagaatttc cttggccgca 360
ccaccacgat ttacaacacc aacgaaaacg ttggagatat cgatggaagt gggtgttatg 420
gaggaggaga cggtggtggt ggctcactag gactttcgat gataaagaca tggctgagaa 480
atcaacccgt ggataatgtt gataatcaag aaaatggcaa tggtgcaaaa ggcctgtccc 540
tctcaatgaa ctcatctact tcttgtgata acaacaacta cagcagtaac aaccttgttg 600
cccaagggaa gactattgat gatagcgttg aagctacacc gaagaaaact attgagagtt 660
ttggacagag gacgtctata taccgcggtg ttacaaggca tcggtggaca ggaagatatg 720
aggcacattt atgggataat agttgtaaac gagaaggcca aacgcgcaaa ggaagacaag 780
tttatttggg aggttatgac aaagaagaaa aagcagctag ggcttatgat ttagccgcac 840
tcaagtattg gggaaccacc actactacta acttccccat gagcgaatat gagaaagaga 900
tagaagagat gaagcacatg acaaggcaag agtatgttgc ctcacttcgc aggaaaagta 960
gtggtttctc tcgtggtgca tcgatttatc gtggagtaac aagacatcac caacatggaa 1020
gatggcaagc taggatagga agagtcgccg gtaacaaaga cctctacttg ggaacttttg 1080
gcacacaaga agaagctgca gaggcatacg acattgcggc catcaaattc agaggattaa 1140
ccgcagtgac taacttcgac atgaacagat acaacgttaa agcaatcctc gaaagcccta 1200
gtcttcctat tggtagcgcc gcaaaacgtc tcaaggaggc taaccgtccg gttccaagta 1260
tgatgatgat cagtaataac gtttcagaga gtgagaataa tgctagcggt tggcaaaacg 1320
ctgcggttca gcatcatcag ggagtagatt tgagcttatt gcagcaacat caagagaggt 1380
acaatggtta ttattacaat ggaggaaact tgtcttcgga gagtgctagg gcttgtttca 1440
aacaagagga tgatcaacac catttcttga gcaacacgca gagcctcatg actaatatcg 1500
atcatcaaag ttctgtttca gatgattcgg ttactgtttg tggaaatgtt gttggttatg 1560
gtggttatca aggatttgca gccccggtta actgcgatgc ctacgctgct agtgagtttg 1620
actataacgc aagaaaccat tattactttg ctcagcagca gcagacccag cattcgccag 1680
gaggagattt tcccgcggca atgacgaata atgttggctc taatatgtat taccatgggg 1740
aaggtggtgg agaagttgct ccaacattta cagtttggaa cgacaattag aaataatagt 1800
taaagatctt tagttatatg cgttgttgtg tggtgttgaa cagtttgata ctttgattat 1860
gttttttttt ctctttttca ttttgttggt tagtttctta agacttattt tttgtttcca 1920
ttagttggat aaattttcgg acttaagggt cacttctgtt ctgacttctg tctaatacag 1980
aaaagttttc ataaaaaaaa aaaaaaaaaa a 2011

<210> 4
<211> 579
<212> PRT
<213> Brassica napus

<400> 4

```
Met Asn Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro Tyr Glu Gln Asn
 1               5                  10                  15

His His Arg Lys Asp Val Tyr Ser Ser Thr Thr Thr Thr Val Val Asp
            20                  25                  30

Val Ala Gly Glu Tyr Cys Tyr Asp Pro Thr Ala Ala Ser Asp Glu Ser
        35                  40                  45

Ser Ala Ile Gln Thr Ser Phe Pro Ser Pro Phe Gly Val Val Val Asp
    50                  55                  60

Ala Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn
65                  70                  75                  80

Gly Cys Ala Cys Asn Asn Ile His Asn Asp Glu Gln Asp Gly Pro Lys
                85                  90                  95

Leu Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu
            100                 105                 110

Asn Val Gly Asp Gly Ser Gly Ser Gly Cys Tyr Gly Gly Gly Asp Gly
        115                 120                 125

Gly Gly Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Arg Asn
    130                 135                 140

Gln Pro Val Asp Asn Val Asp Asn Gln Glu Asn Gly Asn Ala Ala Lys
145                 150                 155                 160

Gly Leu Ser Leu Ser Met Asn Ser Ser Thr Ser Cys Asp Asn Asn Asn
                165                 170                 175

Asp Ser Asn Asn Asn Val Val Ala Gln Gly Lys Thr Ile Asp Asp Ser
            180                 185                 190

Val Glu Ala Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr
        195                 200                 205

Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu
    210                 215                 220

Ala His Leu Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys
225                 230                 235                 240

Gly Arg Gln Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala
                245                 250                 255
```

```
Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Thr Thr Thr Thr
            260                 265                 270

Thr Asn Phe Pro Met Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys
        275                 280                 285

His Met Thr Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser
    290                 295                 300

Gly Phe Ser Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His
305                 310                 315                 320

Gln His Gly Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys
                325                 330                 335

Asp Leu Tyr Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala
            340                 345                 350

Tyr Asp Ile Ala Ala Ile Lys Phe Arg Gly Leu Thr Ala Val Thr Asn
        355                 360                 365

Phe Asp Met Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser
    370                 375                 380

Leu Pro Ile Gly Ser Ala Ala Lys Arg Leu Lys Glu Ala Asn Arg Pro
385                 390                 395                 400

Val Pro Ser Met Met Met Ile Ser Asn Asn Val Ser Glu Ser Glu Asn
                405                 410                 415

Ser Ala Ser Gly Trp Gln Asn Ala Ala Val Gln His His Gln Gly Val
            420                 425                 430

Asp Leu Ser Leu Leu His Gln His Gln Glu Arg Tyr Asn Gly Tyr Tyr
        435                 440                 445

Tyr Asn Gly Gly Asn Leu Ser Ser Glu Ser Ala Arg Ala Cys Phe Lys
    450                 455                 460

Gln Glu Asp Asp Gln His His Phe Leu Ser Asn Thr Gln Ser Leu Met
465                 470                 475                 480

Thr Asn Ile Asp His Gln Ser Ser Val Ser Asp Asp Ser Val Thr Val
                485                 490                 495

Cys Gly Asn Val Val Gly Tyr Gly Gly Tyr Gln Gly Phe Ala Ala Pro
            500                 505                 510

Val Asn Cys Asp Ala Tyr Ala Ala Ser Glu Phe Asp Tyr Asn Ala Arg
        515                 520                 525

Asn His Tyr Tyr Phe Ala Gln Gln Gln Gln Thr Gln Gln Ser Pro Gly
    530                 535                 540

Gly Asp Phe Pro Ala Ala Met Thr Asn Asn Val Gly Ser Asn Met Tyr
```

545 550 555 560

Tyr His Gly Glu Gly Gly Gly Glu Val Ala Pro Thr Phe Thr Val Trp
565 570 575

Asn Asp Asn

<210> 5
<211> 4873
<212> DNA
<213> Brassica napus

<220>
<221> intron
<222> (1846)..(2298)

<220>
<221> intron
<222> (2720)..(2952)

<220>
<221> intron
<222> (3036)..(3160)

<220>
<221> intron
<222> (3170)..(3314)

<220>
<221> intron
<222> (3404)..(3553)

<220>
<221> intron
<222> (3628)..(3797)

<220>
<221> intron
<222> (3849)..(3961)

<220>
<221> intron
<222> (4039)..(4148)

<220>
<221> misc_feature
<222> (1620)..(1622)
<223> start codon

<220>
<221> misc_feature
<222> (4856)..(4858)
<223> stop codon

<400> 5

atctctccac cgattcgtta cccagtgctt gaaaatatga tgactacgaa tcaattaaat 60
ggagaagctc cactgcttgt gtaggtggaa gctcaagcaa caaccggaaa cctcggcgtt 120
atcgggagtt agcatcgtta tttgccaaaa tttccgccgc agagatgaaa cgattcaaga 180
gaaaccctca aataggttag ccataaaaca gtgaattagt atgatttaag agataagaag 240
agaagatgag ttcaagaaaa gaaatactca catctattta tactgtttac acaccgcctt 300
tcagatctaa gcaaagcatt gaagatgaat cgtggaggag agttaatagg atttaacaca 360
aagccattaa ccaaaccgtt gcaggtcggg agacgaaccg caaaagtcac gcctagccgt 420
cgcacgaaga ggagcgatga atttcgtttt ctcgctgcag tcgtattagg gatagacgga 480
gctcattatc gttgggccgg aaacacttct aatctcacag cccatgaaca cactaaagaa 540
cgaaaccgaa aatgtttgaa gtttaatgaa acgtgcggtt tgccttatgg acacatgtca 600
ttacgatatg aaatgattta tctacgtgga tcataggtgt ctctctaagg agagagcaaa 660
cctatacttt atataaatag atttgtatca ttctaagagg tgtttaagat ttttgcataa 720
atattaaaaa aaaatacaaa ttttttatgta attagttttg gttacataaa ataacattaa 780
ataaaattaa ttcaaccaat aaaaaaatac ggtattttat aattggtcaa aaataaaaat 840
aaaacattaa atttcaccta gaattacgag aatgtcactt attttgaaac aaaatcaaaa 900
tctttaaaca tcaattaaac tgatacggat ggagtatata tctttacaga gaacatatat 960
atatgttttt cttgtaagcg tccatctctt cttagtcatg tagttcaaat accagctgca 1020
gtaaaaccat gaatatttga atttgttgta aaatattcga agcgactact gcacgtttgg 1080
aagcaaaacg ccaaacgcaa tcgctcgctc ggtcataggg tcacacatac acatgtgact 1140
agcattatgg gtcttaattc aacagcgagt gattttggga tttattatta gttctcgtgt 1200
tactctcact ttaacacaaa gtcactaacc ttatttacac atgaagagag gtttgaaagg 1260
gcttttgact gattaattat aatgtattaa accaaactag aattaagaga ttaggcattg 1320
aattacatta ccaccaccac ccaccattca aaccgaccaa tacatctcca cagttttcaa 1380
gtaaaacaac tttttttttgt tgttccttcg gaatttaaat aaatattcgt ttatataaat 1440
gcgcatgata tgacgcctcg gaagaaatga aacattatat ctttgacttt tcttctccta 1500
gttcatctct cttctttaag accaaaacct ttttctcctc ctcttcatgc atgaacccta 1560
actaagttct tcttctttta ccttttacca agaactcgtt agatcactct ctgaactcaa 1620
tgaataataa ctggttaggc ttttctctct ctccttatga acaaaatcac catcgtaagg 1680
acgtctactc ttccaccacc acaaccgtcg tagatgtcgc cggagagtac tgttacgatc 1740
cgaccgctgc ctccgatgag tcttcagcca tccaaacatc gtttccttct ccctttggtg 1800
tcgtcgtcga tgctttcacc agagacaaca atagtcactc ccgaggttat tgttttagaa 1860
ctacttgttt ttttttgatt tgtttatttg tttagtttcc tcttcttcca atgcgtagaa 1920
caaagaccaa tacacacgca cgcatactag ccctattttt tccttgggct tatttatcga 1980
tttcatttat tttgagaata tcaatgtgtg gggtttgatg tttgtttgca tatagtaata 2040
ctaaaacata tgccagttat acatagattt tttttaaaga tatacatgga tatgaaatga 2100
aatttgacat ttcctccttt attcaatatc ataatatgat cacatacatg tgtacctttt 2160
gatttgtata tttgtttctt acagttgaag gagagaataa ccaaatatcc atttgtatat 2220
tatagatcgg tgatgaaaag taaatttaac aaattatgat aatataggcc attaatcttt 2280
gatttttttt ctttatagat tgggacatca atggttgtgc atgcaataac atccacaacg 2340
atgagcaaga tggaccaaag cttgagaatt tccttggccg caccaccacg atttacaaca 2400
ccaacgaaaa cgttggagat ggaagtggaa gtggctgtta tggaggagga gacggtggtg 2460
gtggctcact aggactttcg atgataaaga catggctgag aaatcaaccc gtggataatg 2520
ttgataatca agaaaatggc aatgctgcaa aaggcctgtc cctctcaatg aactcatcta 2580
cttcttgtga taacaacaac gacagcaata acaacgttgt tgcccaaggg aagactattg 2640
atgatagcgt tgaagctaca ccgaagaaaa ctattgagag ttttggacag aggacgtcta 2700
tataccgcgg tgttacaagg tgcccttcat ttatttaatt aaaatgtgta aaatgtcgct 2760
tgaattgtta tcttcttggt aaagtctggg acattgatct aatggctctg ttgcgagagt 2820
gctaccgaat ggtccttgat atatagtatc aaagagagat attgttatta tgggcttata 2880
tagaataata catatatata tatatataca tggtagctgt tgatgacatg tatgttcgta 2940
ttaaatgata aggcatcggt ggacaggaag atatgaggca catttatggg ataatagttg 3000
taaaagagaa ggccaaacgc gcaaaggaag acaaggtata tatatattca ttgataattt 3060
gatcatattt tcatacacga tttactttca aactaatata ggtttttcga tcattgttca 3120
tgtttttatc aaaatttgca cctggtggtt gtcttctcag tttatttggg taagtaattt 3180
attataaatt ggacgaagct gtgatgggta aatctaaatt atataatcaa atttgtttat 3240

```
tttttgtgta tacattcatt atataatcaa aatagcgata cgatctacat tcaattgttg 3300
tctatatcat gcaggaggtt atgacaaaga agaaaaagca gctagggctt atgatttagc 3360
cgcactcaag tattggggaa ccaccactac tactaacttc cccgtaagtc aatcaatgtt 3420
gtacaagatt tcataactta gaaccaattt tattcttttt ttataagatg ctattatctt 3480
attattaatt gccatgttta tatcgttaca tttattacaa taaaaagtac ttttggtttg 3540
atataatatg tagatgagcg aatatgaaaa agaggtagaa gagatgaagc acatgacaag 3600
gcaagagtat gttgcctcac tgcgcaggta tataatggaa cttctgatat tattgcatat 3660
ggcatctatt attatacatg tatattagta ttttatatat agaacccatc acgctcacgt 3720
ttatatttaa aaatatgtcc gtattcacgt cagattatca gcatacacct atatataata 3780
gacattaaaa tatgcaggaa aagtagtggt ttctctcgtg gtgcatcgat ttatcgtgga 3840
gtaacaaggt attcatacag agagaacgaa tcctattttg ttacgtacat atatatataa 3900
aaatataatt ataagatatc acattttata ttatgaatat ttcttctaat gggtccaaaa 3960
gacatcacca acatggaaga tggcaagcta ggataggaag agtcgccggt aacaaagacc 4020
tctacttggg aacttttggt acgtttagtc ttctcttact aaacttcaca atcaaatcta 4080
taacaaaaga tatcaactaa aaactacaac atatatctaa gtaagctgta catatattat 4140
atatgaaggc acacaagaag aagctgcaga ggcatacgac attgcggcca tcaaattcag 4200
aggattaacc gcagtgacta acttcgacat gaacagatac aacgttaaag caatcctcga 4260
aagccctagt cttcctattg gtagcgccgc aaaacgtctc aaggaggcta accgtccggt 4320
tccaagtatg atgatgatca gtaataacgt ttcagagagt gagaatagtg ctagcggttg 4380
gcaaaacgct gcggttcagc atcatcaggg agtagatttg agcttattgc accaacatca 4440
agagaggtac aatggttatt attacaatgg aggaaacttg tcttcggaga gtgctagggc 4500
ttgtttcaaa caagaggatg atcaacacca tttcttgagc aacacgcaga gcctcatgac 4560
taatatcgat catcaaagtt ctgtttcgga tgattcggtt actgtttgtg gaaatgttgt 4620
tggttatggt ggttatcaag gatttgcagc cccggttaac tgcgatgcct acgctgctag 4680
tgagtttgat tataacgcaa gaaaccatta ttactttgct cagcagcagc agacccagca 4740
gtcgccaggt ggagattttc ccgcggcaat gacgaataat gttggctcta atatgtatta 4800
ccatggggaa ggtggtggag aagttgctcc aacatttaca gtttggaacg acaattagaa 4860
aaaatagtta aag                                                    4873
```


<210> 6
<211> 5151
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> intron
<222> (2249)..(2578)

<220>
<221> intron
<222> (2994)..(3220)

<220>
<221> intron
<222> (3304)..(3420)

<220>
<221> intron
<222> (3429)..(3521)

<220>
<221> intron
<222> (3611)..(3770)

<220>
<221> intron
<222> (3845)..(3969)

<220>
<221> intron
<222> (4020)..(4151)

<220>
<221> intron
<222> (4229)..(4310)

<220>
<221> misc_feature
<222> (2026)..(2028)
<223> start codon

<220>
<221> misc_feature
<222> (5033)..(5035)
<223> stop codon

<400> 6
tctcaaactc atccatctga ttttaataac agtttttct tctttttctt ttgttgtttt 60
ttaccacttt tctttctttt tctcattttc tacttacttc cagatttttc attttcctat 120
ttttggtcac acgctcttgt cagttgtaga tatcttcatc tacaggtgtt tccttttatt 180
ttcagatgga atctcaatct acaggtgttt ctcacttcaa taaattacgg cccccaaaaa 240
atttagtttt tgtatttaca agaaacatag cataatatga tacatatggt tttgaagtac 300
tgttttttac acaaaacttt gattataaaa cctcagccgt tctttcgtat ttagaattta 360
aacgcatgca atgaagtcat tcgtgaatga tatataaata gtttgtttat ttgttatata 420
tcgtcccgcc ccggatcaaa acctaaagta agtgaataaa attttctttt gtagagataa 480
gaaaatttgt accgcgtatc gaaaatgtaa aacctatttt aatttctaga tctactaatt 540
gggtttgagg tattgaaata attgggtacc aaaggtttgg ggtactatat ataaaaagca 600
gataagaaca aattgttagg aaaaaataat atgattttgt aggtaccgag gcaattctag 660
aacgtgtgtt ggtggtgtgt tagatattgc aggcataata atggaagaag tgaaattata 720
ttacaattaa ataggaagac gagaatccat tgaatcatat cttaccagtc caaacttttt 780
ttaagtatat aaatctttga aagagtataa acccatgcac atgcccactt tcgtctcatt 840
gatccatgtg tataccctat agtttcctcc ctaattactc taattccccc aaatcatttt 900
ttaatttgat acaattagtc ggataagctc aaactacttt actattggtg cttagcatgt 960
acagtacata tctagcatcc gaaccctact agccatccac atcttatgta cataattatg 1020
actgttttaa gtacttttct actttcgttt acaatgtttg tttgaaaatt tgaggcgttt 1080
tttactggtt gaactgtagc cactaagaca ctaagacttc aaaattcaaa taggaaaatc 1140
tatactttta caatatcttt gcatgtcaaa ttatttttaa cgtggttata cattttgcct 1200
aagatttaga gtacattcat aataacaaca ataaaatatt tctatatata gtaggtttag 1260
tgaagttact atatgagata gttcatcgca ttgatcacgt ctgatgcgaa tcacatatcc 1320
tatatctagt tgaacatatg tttcgtggaa gacaggaacc atctcttaga cccgcacttc 1380
aaaatatcac aaaacacgaa accatgaatc ttttgagttt gttaaaaaat actaaaagtg 1440
acgagttcgc gtttggaaaa aatgccaaac taaatcgctg gctcgtgtca tacgttcaca 1500
catacacatg tctctaagag acacagcatc attggtctta aatcgacaac gagtgagttt 1560
ttggactttt acctattggt cctcgacatg tttacccatt tttgtcattt acatttaaca 1620
ttttatacgc atgaagagag agagacagaa agcagagatt tgaaatggtt tttgactgat 1680
taattaaagt gtcatcaaaa caaattggga ttacgagatt atccagttga aacgacatta 1740
ctacccctac ccttcaaacc gaccaataca tctccacatt tttcaagtaa atatttttttc 1800
tttctgaatt taattgcaaa attctctaaa tgcgcataat atgtcgcctc ggaagaaatg 1860
aacattatat ttttgacttt tcttcttctt cttcctcttc tctcttcatt taacaccaaa 1920

acctttttct ttctcctctt catgcatgaa ccctaactaa gttcttttc ctattcttct 1980
tctctcatct atcacaagga gtagttagaa tattatatga actcgatgaa taactggtta 2040
ggcttctctc tctctcctca tgatcaaaat catcaccgta cggatgttga ctcctccacc 2100
accagaaccg ccgtagatgt tgccggaggg tactgttttg atctggccgc tccctccgat 2160
gaatcttctg ccgttcaaac atcttttctt tctcctttcg gtgtcaccct cgaagctttc 2220
accagagaca ataatagtca ctcccgaggt ttgtgtttta aaaatattta ttttatcttt 2280
gtttttgtta tttttccccc ttcttccaat gcatagaaca aagaccaaga ctcacgcacg 2340
tagccctatt tttgtttttc attgtttatc gatttcatct cttttgagaa tttccatgag 2400
tggggtttag tgtttgttca catgatcaca tctcatgaat ttaaacttag taaaacatga 2460
aactagacat ttattttgta ccctttttatc cttataaaat gaaaattcca tttcgtatat 2520
tatagatcgg tgatgaatca aacccaacgt tggggatcgc tttgtttttt gtctatagat 2580
tgggacatca atggtggtgc atgcaataca ttaaccaata acgaacaaaa tggaccaaag 2640
cttgagaatt tcctcggccg caccaccacg atttacaata ccaacgagac cgttgtagat 2700
ggaaatggcg attgtggagg aggagacggt ggtggtggcg gctcactagg cctttcgatg 2760
ataaaaacat ggctgagtaa tcattcggtt gctaatgcta atcatcaaga caatggtaac 2820
ggtgcacgag gcttgtccct ctctatgaat tcatctacta gtgatagcaa caactacaac 2880
aacaatgatg atgtcgtcca agagaagact attgttgatg tcgtagaaac tacaccgaag 2940
aaaactattg agagttttgg acaaaggacg tctatatacc gcggtgttac aaggttaatt 3000
tcattgatct atgtatattt ttattgtgct taaattgtga ttttcttggt attgtttggg 3060
acattctaat ggttcggttg agagagagtg caacggaatg tctctcaatg tatattaaag 3120
agaaacatta attagtgtac atgggtttat atatacaata atacgtcata tatatggtat 3180
gctcttgatc atagtatata atgtttgaat ttaatgtcag gcatcggtgg acaggtagat 3240
acgaggcaca tttatgggac aatagttgca aaagagaagg ccagactcgc aaaggaagac 3300
aaggtactat atatataaag ctaatttttt aattttcatt taccatttat tttcaaacta 3360
atttaggttt tcttttcatg tgtttcatca aaatttgcac ctgatggctc tcttttcagt 3420
ttatctgggt aagttcttga ttttaagcta taaattaata atagatgact attaaatcta 3480
ttctaagcaa aatataattg ttgtgttatc tgatcctaca ggaggttatg acaaagaaga 3540
aaaagcagct agggcttacg atttagccgc actaaagtat tggggaccca ccactactac 3600
taacttcccc gtatgttaat taatcaataa tatatacata aattcctaac ttctaaccaa 3660
ttttagtctg aataatgcca atctcttaaa ctagtattat cttactatta actgtcatgt 3720
ttatattgtt acaataaaaa ttagtaatgt tggttggata taatattcag ttgagtgaat 3780
atgagaaaga ggtagaagag atgaagcaca tgacgaggca agagtatgtt gcctctctgc 3840
gcaggtacag aatgaaactc ttgaatttat tgcattttag aaacccatca cgtatatatt 3900
tattaaaata tatcgtaaca ttgaataaat cattatttgg aaagatataa gaaacatgta 3960
aatatgcagg aaaagtagtg gtttctctcg tggtgcatcg atttatcgag gagtaacaag 4020
gtacgtataa tccatctaga tatggaacga atactagtgt ttcattattt tttttgatgt 4080
atacataata attgtcatac aatactatta atctaatcta attaatattt cctttaaaat 4140
ggttccaaaa ggcatcacca acatggaagg tggcaagcta ggatcggaag agtcgccggt 4200
aacaaagacc tctacttggg aactttcggt acattttcca ataaaatcta tatactataa 4260
gatattaaat atacacaaat atatctaagt gaatcataca aattatgtag gcacacagga 4320
agaggctgct gaggcttatg acattgcagc cattaaattc agaggattaa gcgcagtgac 4380
taacttcgac atgaacagat acaatgttaa agcaatcctc gagagcccga gtctacctat 4440
tggtagttct gcgaaacgtc tcaaggacgt taacaatccg gttccagcta tgatgattag 4500
taataacgtt tcagagagtg caaataatgt tagcggttgg caaaacactg cgtttcagca 4560
tcatcaggga atggatttga gcttattgca gcaacagcag gagaggtacg ttggttatta 4620
caatggagga aacttgtcta ccgagagtac tagggtttgt ttcaaacaag aggaggaaca 4680
acaacacttc ttgagaaact cgcccgagtca catgactaat gttgatcatc atagctcgac 4740
ctctgatgat tctgttaccg tttgtggaaa tgttgttagt tatggtggtt atcaaggatt 4800
cgcaatccct gttggaacat cggttaatta cgatcccttt actgctgctg agattgctta 4860
caacgcaaga aatcattatt actatgctca gcatcagcaa caacagcaga ttcagcagtc 4920
gccgggagga gattttccgg tggcgatttc gaataaccat agctctaaca tgtactttca 4980
cggggaaggt ggtggagaag ggctccaac gttttcagtt tggaacgaca cttagaaaaa 5040
taagtaaaag atcttttagt tgtttgcttt gtatgttgcg aacagtttga ttctgttttt 5100
ctttttcctt tttttgggta attttcttat aactttttc atagtttcga t 5151

<210> 7
<211> 581
<212> PRT
<213> Arabidopsis thaliana

<400> 7
Met Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro His Asp Gln Asn His
1 5 10 15

His Arg Thr Asp Val Asp Ser Ser Thr Thr Arg Thr Ala Val Asp Val
20 25 30

Ala Gly Gly Tyr Cys Phe Asp Leu Ala Ala Pro Ser Asp Glu Ser Ser
35 40 45

Ala Val Gln Thr Ser Phe Leu Ser Pro Phe Gly Val Thr Leu Glu Ala
50 55 60

Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn Gly
65 70 75 80

Gly Ala Cys Asn Thr Leu Thr Asn Asn Glu Gln Asn Gly Pro Lys Leu
85 90 95

Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu Thr
100 105 110

Val Val Asp Gly Asn Gly Asp Cys Gly Gly Gly Asp Gly Gly Gly Gly
115 120 125

Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Ser Asn His Ser
130 135 140

Val Ala Asn Ala Asn His Gln Asp Asn Gly Asn Gly Ala Arg Gly Leu
145 150 155 160

Ser Leu Ser Met Asn Ser Ser Thr Ser Asp Ser Asn Asn Tyr Asn Asn
165 170 175

Asn Asp Asp Val Val Gln Glu Lys Thr Ile Val Asp Val Val Glu Thr
180 185 190

Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr Ser Ile Tyr
195 200 205

Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu Ala His Leu
210 215 220

Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys Gly Arg Gln
225 230 235 240

Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala Arg Ala Tyr
245 250 255

Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Thr Thr Thr Thr Asn Phe

```
                260                 265                 270

Pro Leu Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys His Met Thr
        275                 280                 285

Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser Gly Phe Ser
    290                 295                 300

Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His Gln His Gly
305                 310                 315                 320

Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys Asp Leu Tyr
                325                 330                 335

Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala Tyr Asp Ile
            340                 345                 350

Ala Ala Ile Lys Phe Arg Gly Leu Ser Ala Val Thr Asn Phe Asp Met
        355                 360                 365

Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser Leu Pro Ile
    370                 375                 380

Gly Ser Ser Ala Lys Arg Leu Lys Asp Val Asn Asn Pro Val Pro Ala
385                 390                 395                 400

Met Met Ile Ser Asn Asn Val Ser Glu Ser Ala Asn Asn Val Ser Gly
                405                 410                 415

Trp Gln Asn Thr Ala Phe Gln His His Gln Gly Met Asp Leu Ser Leu
            420                 425                 430

Leu Gln Gln Gln Gln Glu Arg Tyr Val Gly Tyr Tyr Asn Gly Gly Asn
        435                 440                 445

Leu Ser Thr Glu Ser Thr Arg Val Cys Phe Lys Gln Glu Glu Glu Gln
    450                 455                 460

Gln His Phe Leu Arg Asn Ser Pro Ser His Met Thr Asn Val Asp His
465                 470                 475                 480

His Ser Ser Thr Ser Asp Asp Ser Val Thr Val Cys Gly Asn Val Val
                485                 490                 495

Ser Tyr Gly Gly Tyr Gln Gly Phe Ala Ile Pro Val Gly Thr Ser Val
            500                 505                 510

Asn Tyr Asp Pro Phe Thr Ala Ala Glu Ile Ala Tyr Asn Ala Arg Asn
        515                 520                 525

His Tyr Tyr Tyr Ala Gln His Gln Gln Gln Gln Gln Ile Gln Gln Ser
    530                 535                 540

Pro Gly Gly Asp Phe Pro Val Ala Ile Ser Asn Asn His Ser Ser Asn
545                 550                 555                 560
```

```
Met Tyr Phe His Gly Glu Gly Gly Gly Glu Gly Ala Pro Thr Phe Ser
                565                 570                 575

Val Trp Asn Asp Thr
            580
```

<210> 8
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 8
gaggcagcgg tcggatcgta acagtactct 30

<210> 9
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 9
cataaggaga gagagaaaag cctaaccagt 30

<210> 10
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 10
accaagaact cgttagatc 19

<210> 11
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 11
aacgcatata actaaagatc 20

<210> 12
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 12
ccatggatcc agagacgaag cgaaac 26

<210> 13
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 13
actccatgga taataactgg ttaggc 26

<210> 14
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 14
aaattctcaa gctttggtcc atcttg 26

SEQUENCE LISTING

<110> Plant Research International
Her Majesty the Queen in Right of Canada as Represented by the Minister of Agriculture and Agri-Food Canada

<120> Use of the BNM3 Transcriptional Activator to Control Plant Embryogenesis and Regenerqation Processes

<130> 08-887547WO

<140>
<141>

<150> EP 99201745.9-2106
<151> 1999-06-02

<160> 14

<170> PatentIn Ver. 2.1

<210> 1
<211> 2014
<212> DNA
<213> Brassica napus

<400> 1
gttcatctct cttctttaag accaaaacct ttttctcctc ctcttcatgc atgaacccta 60
actaagttct tcttctttta ccttttacca agaactcgtt agatcactct ctgaactcaa 120
tgaataataa ctggttaggc ttttctctct ctccttatga acaaaatcac catcgtaagg 180
acgtctactc ttccaccacc acaaccgtcg tagatgtcgc cggagagtac tgttacgatc 240
cgaccgctgc ctccgatgag tcttcagcca tccaaacatc gtttccttct ccctttggtg 300
tcgtcgtcga tgctttcacc agagacaaca atagtcactc ccgagattgg gacatcaatg 360
gttgtgcatg caataacatc cacaacgatg agcaagatgg accaaagctt gagaatttcc 420
ttggccgcac caccacgatt tacaacacca acgaaaacgt tggagatgga agtggaagtg 480
gctgttatgg aggaggagac ggtggtggtg gctcactagg actttcgatg ataaagacat 540
ggctgagaaa tcaacccgtg gataatgttg ataatcaaga aaatggcaat gctgcaaaag 600
gcctgtccct ctcaatgaac tcatctactt cttgtgataa caacaacgac agcaataaca 660
acgttgttgc ccaagggaag actattgatg atagcgttga agctacaccg aagaaaacta 720
ttgagagttt tggacagagg acgtctatat accgcggtgt tacaaggcat cggtggacag 780
gaagatatga ggcacattta tgggataata gttgtaaaag agaaggccaa acgcgcaaag 840
gaagacaagt ttatttggga ggttatgaca aagaagaaaa agcagctagg gcttatgatt 900
tagccgcact caagtattgg ggaaccacca ctactactaa cttccccatg agcgaatatg 960
aaaaagaggt agaagagatg aagcacatga caaggcaaga gtatgttgcc tcactgcgca 1020
ggaaaagtag tggtttctct cgtggtgcat cgatttatcg tggagtaaca agacatcacc 1080
aacatggaag atggcaagct aggataggaa gagtcgccgg taacaaagac ctctacttgg 1140
gaacttttgg cacacaagaa gaagctgcag aggcatacga cattgcggcc atcaaattca 1200
gaggattaac cgcagtgact aacttcgaca tgaacagata caacgttaaa gcaatcctcg 1260
aaagccctag tcttcctatt ggtagcgccg caaaacgtct caaggaggct aaccgtccgg 1320
ttccaagtat gatgatgatc agtaataacg tttcagagag tgagaatagt gctagcggtt 1380
ggcaaaacgc tgcggttcag catcatcagg gagtagattt gagcttattg caccaacatc 1440
aagagaggta caatggttat tattacaatg gaggaaactt gtcttcggag agtgctaggg 1500
cttgtttcaa acaagaggat gatcaacacc atttcttgag caacacgcag agcctcatga 1560
ctaatatcga tcatcaaagt tctgtttcgg atgattcggt tactgtttgt ggaaatgttg 1620
ttggttatgg tggttatcaa ggatttgcag ccccggttaa ctgcgatgcc tacgctgcta 1680
gtgagtttga ttataacgca agaaaccatt attactttgc tcagcagcag cagacccagc 1740
agtcgccagg tggagatttt cccgcggcaa tgacgaataa tgttggctct aatatgtatt 1800
accatgggga aggtggtgga gaagttgctc caacatttac agtttggaac gacaattaga 1860
aaaaatagtt aaagatcttt agttatatgc gttgttgtgt gctggtgaac agtgtgatac 1920
tttgattatg ttttttttctt tctctttttc tttttcttgg ttaatttctt aagacttatt 1980
tttagtttcc attagttgga taaatttcca gacc 2014

<210> 2
<211> 579

<212> PRT
<213> Brassica napus

<400> 2

```
Met Asn Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro Tyr Glu Gln Asn
 1               5                  10                  15

His His Arg Lys Asp Val Tyr Ser Ser Thr Thr Thr Thr Val Val Asp
            20                  25                  30

Val Ala Gly Glu Tyr Cys Tyr Asp Pro Thr Ala Ala Ser Asp Glu Ser
        35                  40                  45

Ser Ala Ile Gln Thr Ser Phe Pro Ser Pro Phe Gly Val Val Val Asp
    50                  55                  60

Ala Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn
65                  70                  75                  80

Gly Cys Ala Cys Asn Asn Ile His Asn Asp Glu Gln Asp Gly Pro Lys
                85                  90                  95

Leu Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu
            100                 105                 110

Asn Val Gly Asp Gly Ser Gly Ser Gly Cys Tyr Gly Gly Gly Asp Gly
        115                 120                 125

Gly Gly Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Arg Asn
    130                 135                 140

Gln Pro Val Asp Asn Val Asp Asn Gln Glu Asn Gly Asn Ala Ala Lys
145                 150                 155                 160

Gly Leu Ser Leu Ser Met Asn Ser Ser Thr Ser Cys Asp Asn Asn Asn
                165                 170                 175

Asp Ser Asn Asn Asn Val Val Ala Gln Gly Lys Thr Ile Asp Asp Ser
            180                 185                 190

Val Glu Ala Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr
        195                 200                 205

Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu
    210                 215                 220

Ala His Leu Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys
225                 230                 235                 240

Gly Arg Gln Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala
                245                 250                 255

Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Thr Thr Thr Thr
            260                 265                 270

Thr Asn Phe Pro Met Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys
        275                 280                 285

His Met Thr Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser
    290                 295                 300

Gly Phe Ser Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His
305                 310                 315                 320

Gln His Gly Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys
                325                 330                 335
```

```
Asp Leu Tyr Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala
            340                 345                 350

Tyr Asp Ile Ala Ala Ile Lys Phe Arg Gly Leu Thr Ala Val Thr Asn
        355                 360                 365

Phe Asp Met Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser
    370                 375                 380

Leu Pro Ile Gly Ser Ala Ala Lys Arg Leu Lys Glu Ala Asn Arg Pro
385                 390                 395                 400

Val Pro Ser Met Met Met Ile Ser Asn Asn Val Ser Glu Ser Glu Asn
                405                 410                 415

Ser Ala Ser Gly Trp Gln Asn Ala Ala Val Gln His His Gln Gly Val
            420                 425                 430

Asp Leu Ser Leu Leu His Gln His Gln Glu Arg Tyr Asn Gly Tyr Tyr
        435                 440                 445

Tyr Asn Gly Gly Asn Leu Ser Ser Glu Ser Ala Arg Ala Cys Phe Lys
    450                 455                 460

Gln Glu Asp Asp Gln His His Phe Leu Ser Asn Thr Gln Ser Leu Met
465                 470                 475                 480

Thr Asn Ile Asp His Gln Ser Ser Val Ser Asp Asp Ser Val Thr Val
                485                 490                 495

Cys Gly Asn Val Val Gly Tyr Gly Gly Tyr Gln Gly Phe Ala Ala Pro
            500                 505                 510

Val Asn Cys Asp Ala Tyr Ala Ala Ser Glu Phe Asp Tyr Asn Ala Arg
        515                 520                 525

Asn His Tyr Tyr Phe Ala Gln Gln Gln Gln Thr Gln Gln Ser Pro Gly
    530                 535                 540

Gly Asp Phe Pro Ala Ala Met Thr Asn Asn Val Gly Ser Asn Met Tyr
545                 550                 555                 560

Tyr His Gly Glu Gly Gly Gly Glu Val Ala Pro Thr Phe Thr Val Trp
                565                 570                 575

Asn Asp Asn


<210> 3
<211> 2011
<212> DNA
<213> Brassica napus

<400> 3
ttcttctttt accttttacc aagaactcgt tagatcattt tctgaactcg atgaataata 60
actggttagg cttttctctc tctccttatg aacaaaatca ccatcgtaag gacgtctgct 120
cttccaccac cacaaccgcc gtagatgtcg ccggagagta ctgttacgat ccgaccgctg 180
cctccgatga gtcttcagcc atccaaacat cgtttccttc tccctttggt gtcgtcctcg 240
atgctttcac cagagacaac aatagtcact cccgagattg ggacatcaat ggtagtgcat 300
gtaataacat ccacaatgat gagcaagatg gaccaaaact tgagaatttc cttggccgca 360
ccaccacgat ttacaacacc aacgaaaacg ttggagatat cgatggaagt gggtgttatg 420
gaggaggaga cggtggtggt ggctcactag gactttcgat gataaagaca tggctgagaa 480
atcaacccgt ggataatgtt gataatcaag aaaatggcaa tggtgcaaaa ggcctgtccc 540
tctcaatgaa ctcatctact tcttgtgata acaacaacta cagcagtaac aaccttgttg 600
cccaagggaa gactattgat gatagcgttg aagctacacc gaagaaaact attgagagtt 660
```

```
ttggacagag gacgtctata taccgcggtg ttacaaggca tcggtggaca ggaagatatg 720
aggcacattt atgggataat agttgtaaac gagaaggcca aacgcgcaaa ggaagacaag 780
tttatttggg aggttatgac aaagaagaaa aagcagctag ggcttatgat ttagccgcac 840
tcaagtattg gggaaccacc actactacta acttccccat gagcgaatat gagaaagaga 900
tagaagagat gaagcacatg acaaggcaag agtatgttgc ctcacttcgc aggaaaagta 960
gtggtttctc tcgtggtgca tcgatttatc gtggagtaac aagacatcac caacatggaa 1020
gatggcaagc taggatagga agagtcgccg gtaacaaaga cctctacttg ggaacttttg 1080
gcacacaaga agaagctgca gaggcatacg acattgcggc catcaaattc agaggattaa 1140
ccgcagtgac taacttcgac atgaacagat acaacgttaa agcaatcctc gaaagcccta 1200
gtcttcctat tggtagcgcc gcaaaacgtc tcaaggaggc taaccgtccg gttccaagta 1260
tgatgatgat cagtaataac gtttcagaga gtgagaataa tgctagcggt tggcaaaacg 1320
ctgcggttca gcatcatcag ggagtagatt tgagcttatt gcagcaacat caagagaggt 1380
acaatggtta ttattacaat ggaggaaact tgtcttcgga gagtgctagg gcttgtttca 1440
aacaagagga tgatcaacac catttcttga gcaacacgca gagcctcatg actaatatcg 1500
atcatcaaag ttctgtttca gatgattcgg ttactgtttg tggaaatgtt gttggttatg 1560
gtggttatca aggatttgca gccccggtta actgcgatgc ctacgctgct agtgagtttg 1620
actataacgc aagaaaccat tattactttg ctcagcagca gcagacccag cattcgccag 1680
gaggagattt tcccgcggca atgacgaata atgttggctc taatatgtat taccatgggg 1740
aaggtggtgg agaagttgct ccaacattta cagtttggaa cgacaattag aaataatagt 1800
taaagatctt tagttatatg cgttgttgtg tggtgttgaa cagtttgata ctttgattat 1860
gttttttttt ctctttttca ttttgttggt tagtttctta agacttattt tttgtttcca 1920
ttagttggat aaattttcgg acttaagggt cacttctgtt ctgacttctg tctaatacag 1980
aaaagttttc ataaaaaaaa aaaaaaaaaa a                               2011
```

<210> 4
<211> 579
<212> PRT
<213> Brassica napus

<400> 4

```
Met Asn Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro Tyr Glu Gln Asn
1               5                   10                  15

His His Arg Lys Asp Val Tyr Ser Ser Thr Thr Thr Thr Val Val Asp
            20                  25                  30

Val Ala Gly Glu Tyr Cys Tyr Asp Pro Thr Ala Ala Ser Asp Glu Ser
        35                  40                  45

Ser Ala Ile Gln Thr Ser Phe Pro Ser Pro Phe Gly Val Val Val Asp
    50                  55                  60

Ala Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn
65                  70                  75                  80

Gly Cys Ala Cys Asn Asn Ile His Asn Asp Glu Gln Asp Gly Pro Lys
                85                  90                  95

Leu Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu
            100                 105                 110

Asn Val Gly Asp Gly Ser Gly Ser Gly Cys Tyr Gly Gly Gly Asp Gly
        115                 120                 125

Gly Gly Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Arg Asn
    130                 135                 140

Gln Pro Val Asp Asn Val Asp Asn Gln Glu Asn Gly Asn Ala Ala Lys
145                 150                 155                 160

Gly Leu Ser Leu Ser Met Asn Ser Ser Thr Ser Cys Asp Asn Asn Asn
                165                 170                 175

Asp Ser Asn Asn Asn Val Val Ala Gln Gly Lys Thr Ile Asp Asp Ser
            180                 185                 190
```

Val Glu Ala Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr
195 200 205

Ser Ile Tyr Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu
210 215 220

Ala His Leu Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys
225 230 235 240

Gly Arg Gln Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala
245 250 255

Arg Ala Tyr Asp Leu Ala Ala Leu Lys Tyr Trp Gly Thr Thr Thr Thr
260 265 270

Thr Asn Phe Pro Met Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys
275 280 285

His Met Thr Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser
290 295 300

Gly Phe Ser Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His
305 310 315 320

Gln His Gly Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys
325 330 335

Asp Leu Tyr Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala
340 345 350

Tyr Asp Ile Ala Ala Ile Lys Phe Arg Gly Leu Thr Ala Val Thr Asn
355 360 365

Phe Asp Met Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser
370 375 380

Leu Pro Ile Gly Ser Ala Ala Lys Arg Leu Lys Glu Ala Asn Arg Pro
385 390 395 400

Val Pro Ser Met Met Met Ile Ser Asn Asn Val Ser Glu Ser Glu Asn
405 410 415

Ser Ala Ser Gly Trp Gln Asn Ala Ala Val Gln His His Gln Gly Val
420 425 430

Asp Leu Ser Leu Leu His Gln His Gln Glu Arg Tyr Asn Gly Tyr Tyr
435 440 445

Tyr Asn Gly Gly Asn Leu Ser Ser Glu Ser Ala Arg Ala Cys Phe Lys
450 455 460

Gln Glu Asp Asp Gln His His Phe Leu Ser Asn Thr Gln Ser Leu Met
465 470 475 480

Thr Asn Ile Asp His Gln Ser Ser Val Ser Asp Asp Ser Val Thr Val
485 490 495

Cys Gly Asn Val Val Gly Tyr Gly Gly Tyr Gln Gly Phe Ala Ala Pro
500 505 510

Val Asn Cys Asp Ala Tyr Ala Ala Ser Glu Phe Asp Tyr Asn Ala Arg
515 520 525

Asn His Tyr Tyr Phe Ala Gln Gln Gln Gln Thr Gln Gln Ser Pro Gly
530 535 540

Gly Asp Phe Pro Ala Ala Met Thr Asn Asn Val Gly Ser Asn Met Tyr
545 550 555 560

Tyr His Gly Glu Gly Gly Gly Glu Val Ala Pro Thr Phe Thr Val Trp
565 570 575

Asn Asp Asn

<210> 5
<211> 4873
<212> DNA
<213> Brassica napus

<220>
<221> intron
<222> (1846)..(2298)

<220>
<221> intron
<222> (2720)..(2952)

<220>
<221> intron
<222> (3036)..(3160)

<220>
<221> intron
<222> (3170)..(3314)

<220>
<221> intron
<222> (3404)..(3553)

<220>
<221> intron
<222> (3628)..(3797)

<220>
<221> intron
<222> (3849)..(3961)

<220>
<221> intron
<222> (4039)..(4148)

<220>
<221> misc_feature
<222> (1620)..(1622)
<223> start codon

<220>
<221> misc_feature
<222> (4856)..(4858)
<223> stop codon

<400> 5
atctctccac cgattcgtta cccagtgctt gaaaatatga tgactacgaa tcaattaaat 60
ggagaagctc cactgcttgt gtaggtggaa gctcaagcaa caaccggaaa cctcggcgtt 120
atcgggagtt agcatcgtta tttgccaaaa tttccgccgc agagatgaaa cgattcaaga 180
gaaaccctca aataggttag ccataaaaca gtgaattagt atgatttaag agataagaag 240
agaagatgag ttcaagaaaa gaaatactca catctattta tactgtttac acaccgcctt 300
tcagatctaa gcaaagcatt gaagatgaat cgtggaggag agttaatagg atttaacaca 360
aagccattaa ccaaaccgtt gcaggtcggg agacgaaccg caaaagtcac gcctagccgt 420
cgcacgaaga ggagcgatga atttcgtttt ctcgctgcag tcgtattagg gatagacgga 480

gctcattatc gttgggccgg aaacacttct aatctcacag cccatgaaca cactaaagaa 540
cgaaaccgaa aatgtttgaa gtttaatgaa acgtgcggtt tgccttatgg acacatgtca 600
ttacgatatg aaatgattta tctacgtgga tcataggtgt ctctctaagg agagagcaaa 660
cctatacttt atataaatag atttgtatca ttctaagagg tgtttaagat ttttgcataa 720
atattaaaaa aaaatacaaa tttttatgta attagttttg gttacataaa ataacattaa 780
ataaaattaa ttcaaccaat aaaaaaatac ggtattttat aattggtcaa aaataaaaat 840
aaaacattaa atttcaccta gaattacgag aatgtcactt attttgaaac aaaatcaaaa 900
tctttaaaca tcaattaaac tgatacggat ggagtatata tctttacaga gaacatatat 960
atatgttttt cttgtaagcg tccatctctt cttagtcatg tagttcaaat accagctgca 1020
gtaaaaccat gaatatttga atttgttgta aaatattcga agcgactact gcacgtttgg 1080
aagcaaaacg ccaaacgcaa tcgctcgctc ggtcataggg tcacacatac acatgtgact 1140
agcattatgg gtcttaattc aacagcgagt gattttggga tttattatta gttctcgtgt 1200
tactctcact ttaacacaaa gtcactaacc ttatttacac atgaagagag gtttgaaagg 1260
gcttttgact gattaattat aatgtattaa accaaactag aattaagaga ttaggcattg 1320
aattacatta ccaccaccac ccaccattca aaccgaccaa tacatctcca cagttttcaa 1380
gtaaaacaac tttttttgt tgttccttcg gaatttaaat aaatattcgt ttatataaat 1440
gcgcatgata tgacgcctcg gaagaaatga aacattatat ctttgacttt tcttctccta 1500
gttcatctct cttctttaag accaaaacct ttttctcctc ctcttcatgc atgaacccta 1560
actaagttct tcttctttta ccttttacca agaactcgtt agatcactct ctgaactcaa 1620
tgaataataa ctggttaggc ttttctctct ctccttatga acaaaatcac catcgtaagg 1680
acgtctactc ttccaccacc acaaccgtcg tagatgtcgc cggagagtac tgttacgatc 1740
cgaccgctgc ctccgatgag tcttcagcca tccaaacatc gtttccttct ccctttggtg 1800
tcgtcgtcga tgctttcacc agagacaaca atagtcactc ccgaggttat tgttttagaa 1860
ctacttgttt ttttttgatt tgtttatttg tttagtttcc tcttcttcca atgcgtagaa 1920
caaagaccaa tacacacgca cgcatactag ccctattttt tccttgggct tatttatcga 1980
tttcatttat tttgagaata tcaatgtgtg gggtttgatg tttgtttgca tatagtaata 2040
ctaaaacata tgccagttat acatagattt tttttaaaga tatacatgga tatgaaatga 2100
aatttgacat ttcctccttt attcaatatc ataatatgat cacatacatg tgtacctttt 2160
gatttgtata tttgtttctt acagttgaag gagagaataa ccaaataccc atttgtatat 2220
tatagatcgg tgatgaaaag taaatttaac aaattatgat aatataggcc attaatcttt 2280
gatttttttt ctttatagat tgggacatca atggttgtgc atgcaataac atccacaacg 2340
atgagcaaga tggaccaaag cttgagaatt tccttggccg caccaccacg atttacaaca 2400
ccaacgaaaa cgttggagat ggaagtggaa gtggctgtta tggaggagga gacggtggtg 2460
gtggctcact aggactttcg atgataaaga catggctgag aaatcaaccc gtggataatg 2520
ttgataatca agaaaatggc aatgctgcaa aaggcctgtc cctctcaatg aactcatcta 2580
cttcttgtga taacaacaac gacagcaata acaacgttgt tgcccaaggg aagactattg 2640
atgatagcgt tgaagctaca ccgaagaaaa ctattgagag ttttggacag aggacgtcta 2700
tataccgcgg tgttacaagg tgcccttcat ttatttaatt aaaatgtgta aaatgtcgct 2760
tgaattgtta tcttcttggt aaagtctggg acattgatct aatggctctg ttgcgagagt 2820
gctaccgaat ggtccttgat atatagtatc aaagagagat attgttatta tgggcttata 2880
tagaataata catatatata tatatataca tggtagctgt tgatgacatg tatgttcgta 2940
ttaaatgata aggcatcggt ggacaggaag atatgaggca catttatggg ataatagttg 3000
taaaagagaa ggccaaacgc gcaaaggaag acaaggtata tatatattca ttgataattt 3060
gatcatattt tcatacacga tttactttca aactaatata ggtttttcga tcattgttca 3120
tgtttttatc aaaatttgca cctggtggtt gtcttctcag tttatttggg taagtaattt 3180
attataaatt ggacgaagct gtgatgggta aatctaaatt atataatcaa atttgtttat 3240
ttttgtgtta tacattcatt atataatcaa aatagcgata cgatctacat tcaattgttg 3300
tctatatcat gcaggaggtt atgacaaaga agaaaaagca gctagggctt atgatttagc 3360
cgcactcaag tattggggaa ccaccactac tactaacttc cccgtaagtc aatcaatgtt 3420
gtacaagatt tcataactta gaaccaattt tattcttttt ttataagatg ctattatctt 3480
attattaatt gccatgttta tatcgttaca tttattacaa taaaaagtac ttttggttg 3540
atataatatg tagatgagcg aatatgaaaa agaggtagaa gagatgaagc acatgacaag 3600
gcaagagtat gttgcctcac tgcgcaggta tataatggaa cttctgatat tattgcatat 3660
ggcatctatt attatacatg tatattagta ttttatatat agaacccatc acgctcacgt 3720
ttatatttaa aaatatgtcc gtattcacgt cagattatca gcatacacct atatataata 3780
gacattaaaa tatgcaggaa aagtagtggt ttctctcgtg gtgcatcgat ttatcgtgga 3840
gtaacaaggt attcatacag agagaacgaa tcctatttg ttacgtacat atatatataa 3900
aaatataatt ataagatatc acattttata ttatgaatat ttcttctaat gggtccaaaa 3960
gacatcacca acatggaaga tggcaagcta ggataggaag agtcgccggt aacaaagacc 4020
tctacttggg aacttttggt acgtttagtc ttctcttact aaacttcaca atcaaatcta 4080
taacaaaaga tatcaactaa aaactacaac atatatctaa gtaagctgta catatattat 4140
atatgaaggc acacaagaag aagctgcaga ggcatacgac attgcggcca tcaaattcag 4200
aggattaacc gcagtgacta acttcgacat gaacagatac aacgttaaag caatcctcga 4260
aagccctagt cttcctattg gtagcgccgc aaaacgtctc aaggaggcta accgtccggt 4320
tccaagtatg atgatgatca gtaataacgt ttcagagagt gagaatagtg ctagcggttg 4380
gcaaaacgcc gcggttcagc atcatcaggg agtagatttg agcttattgc accaacatca 4440

agagaggtac aatggttatt attacaatgg aggaaacttg tcttcggaga gtgctagggc 4500
ttgtttcaaa caagaggatg atcaacacca tttcttgagc aacacgcaga gcctcatgac 4560
taatatcgat catcaaagtt ctgtttcgga tgattcggtt actgtttgtg gaaatgttgt 4620
tggttatggt ggttatcaag gatttgcagc cccggttaac tgcgatgcct acgctgctag 4680
tgagtttgat tataacgcaa gaaaccatta ttactttgct cagcagcagc agacccagca 4740
gtcgccaggt ggagatttcc ccgcggcaat gacgaataat gttggctcta atatgtatta 4800
ccatggggaa ggtggtggag aagttgctcc aacatttaca gtttggaacg acaattagaa 4860
aaaatagtta aag 4873

<210> 6
<211> 5151
<212> DNA
<213> Arabidopsis thaliana

<220>
<221> intron
<222> (2249)..(2578)

<220>
<221> intron
<222> (2994)..(3220)

<220>
<221> intron
<222> (3304)..(3420)

<220>
<221> intron
<222> (3429)..(3521)

<220>
<221> intron
<222> (3611)..(3770)

<220>
<221> intron
<222> (3845)..(3969)

<220>
<221> intron
<222> (4020)..(4151)

<220>
<221> intron
<222> (4229)..(4310)

<220>
<221> misc_feature
<222> (2026)..(2028)
<223> start codon

<220>
<221> misc_feature
<222> (5033)..(5035)
<223> stop codon

<400> 6
tctcaaactc atccatctga ttttaataac agtttttttct tctttttctt ttgttgtttt 60
ttaccacttt tcttttctttt tctcattttc tacttacttc cagattttc attttcctat 120
ttttggtcac acgctcttgt cagttgtaga tatcttcatc tacaggtgtt tccttttatt 180
ttcagatgga atctcaatct acaggtgttt ctcacttcaa taaattacgg cccccaaaaa 240
atttagtttt tgtatttaca agaaacatag cataatatga tacatatggt tttgaagtac 300
tgtttttac acaaaacttt gattataaaa cctcagccgt tctttcgtat ttagaattta 360
aacgcatgca atgaagtcat tcgtgaatga tatataaata gtttgtttat ttgttatata 420
tcgtcccgcc ccggatcaaa acctaaagta agtgaataaa attttctttt gtagagataa 480

gaaaatttgt accgcgtatc gaaaatgtaa aacctatttt aatttctaga tctactaatt 540
gggtttgagg tattgaaata attgggtacc aaaggtttgg ggtactatat ataaaaagca 600
gataagaaca aattgttagg aaaaaataat atgattttgt aggtaccgag gcaattctag 660
aacgtgtgtt ggtggtgtgt tagatattgc aggcataata atggaagaag tgaaattata 720
ttacaattaa ataggaagac gagaatccat tgaatcatat cttaccagtc caaacttttt 780
ttaagtatat aaatctttga aagagtataa acccatgcac atgcccactt tcgtctcatt 840
gatccatgtg tataccctat agtttcctcc ctaattactc taattcccct aaatcatttt 900
ttaatttgat acaattagtc ggataagctc aaactacttt actattggtg cttagcatgt 960
acagtacata tctagcatcc gaaccctact agccatccac atcttatgta cataattatg 1020
actgttttaa gtacttttt actttcgttt acaatgtttg tttgaaaatt tgaggcgttt 1080
tttactggtt gaactgtagc cactaagaca ctaagacttc aaaattcaaa taggaaaatc 1140
tatactttta caatatcttt gcatgtcaaa ttatttttaa cgtggttata cattttgcct 1200
aagatttaga gtacattcat aataacaaca ataaaatatt tctatatata gtaggtttag 1260
tgaagttact atatgagata gttcatcgca ttgatcacgt ctgatgcgaa tcacatatcc 1320
tatatctagt tgaacatatg tttcgtggaa gacaggaacc atctcttaga cccgcacttc 1380
aaaatatcac aaaacacgaa accatgaatc ttttgagttt gttaaaaaat actaaaagtg 1440
acgagttcgc gtttggaaaa aatgccaaac taaatcgctg gctcgtgtca tacgttcaca 1500
catacacatg tctctaagag acacagcatc attggtctta aatcgacaac gagtgagttt 1560
ttggactttt acctattggt cctcgacatg tttacccatt tttgtcattt acatttaaca 1620
ttttatacgc atgaagagag agagacagaa agcagagatt tgaaatggtt tttgactgat 1680
taattaaagt gtcatcaaaa caaattggga ttacgagatt atccagttga aacgacatta 1740
ctacccctac ccttcaaacc gaccaataca tctccacatt tttcaagtaa atatttttc 1800
tttctgaatt taattgcaaa attctctaaa tgcgcataat atgtcgcctc ggaagaaatg 1860
aacattatat ttttgacttt tcttcttctt cttcctcttc tctcttcatt taacaccaaa 1920
acctttttct ttctcctctt catgcatgaa ccctaactaa gttctttttc ctattcttct 1980
tctctcatct atcacaagga gtagttagaa tattatatga actcgatgaa taactggtta 2040
ggcttctctc tctctcctca tgatcaaaat catcaccgta cggatgttga ctcctccacc 2100
accagaaccg ccgtagatgt tgccggaggg tactgttttg atctggccgc tccctccgat 2160
gaatcttctg ccgttcaaac atcttttctt tctcctttcg gtgtcaccct cgaagctttc 2220
accagagaca ataatagtca ctcccgaggt ttgtgtttta aaaatattta ttttatcttt 2280
gtttttgtta ttttttcccc ttcttccaat gcatagaaca aagaccaaga ctcacgcacg 2340
tagccctatt tttgtttttc attgtttatc gatttcatct cttttgagaa tttccatgag 2400
tggggtttag tgtttgttca catgatcaca tctcatgaat ttaaacttag taaaacatga 2460
aactagacat ttattttgta ccctttttatc cttataaaat gaaaattcca tttcgtatat 2520
tatagatcgg tgatgaatca aacccaacgt tggggatcgc tttgtttttt gtcttatagat 2580
tgggacatca atggtggtgc atgcaataca ttaaccaata acgaacaaaa tggaccaaag 2640
cttgagaatt tcctcggccg caccaccacg atttacaata ccaacgagac cgttgtagat 2700
ggaaatggcg attgtggagg aggagacggt ggtggtggcg gctcactagg cctttcgatg 2760
ataaaaacat ggctgagtaa tcattcggtt gctaatgcta atcatcaaga caatggtaac 2820
ggtgcacgag gcttgtccct ctctatgaat tcatctacta gtgatagcaa caactacaac 2880
aacaatgatg atgtcgtcca agagaagact attgttgatg tcgtagaaac tacaccgaag 2940
aaaactattg agagttttgg acaaaggacg tctatatacc gcggtgttac aaggttaatt 3000
tcattgatct atgtatattt ttattgtgct taaattgtga ttttcttggt attgtttggg 3060
acattctaat ggttcggttg agagagagtg caacggaatg tctctcaatg tatattaaag 3120
agaaacatta attagtgtac atgggtttat atatacaata atacgtcata tatatggtat 3180
gctcttgatc atagtatata atgtttgaat ttaatgtcag gcatcggtgg acaggtagat 3240
acgaggcaca tttatgggac aatagttgca aaagagaagg ccagactcgc aaaggaagac 3300
aaggtactat atatataaag ctaatttttt aattttcatt taccatttat tttcaaacta 3360
atttaggttt tcttttcatg tgtttcatca aaatttgcac ctgatggctc tcttttcagt 3420
ttatctgggt aagttcttga ttttaagcta taaattaata atagatgact attaaatcta 3480
ttctaagcaa aatataattg ttgtgttatc tgatcctaca ggaggttatg acaaagaaga 3540
aaaagcagct agggcttacg atttagccgc actaaagtat tggggaccca ccactactac 3600
taacttcccc gtatgttaat taatcaataa tatatacata aattcctaac ttctaaccaa 3660
ttttagtctg aataatgcca atctcttaaa ctagtattat cttactatta actgtcatgt 3720
ttatattgtt acaataaaaa ttagtaatgt tggttggata taatattcag ttgagtgaat 3780
atgagaaaga ggtagaagag atgaagcaca tgacgaggca agagtatgtt gcctctctgc 3840
gcaggtacag aatgaaactc ttgaatttat tgcattttag aaacccatca cgtatatatt 3900
tattaaaata tatcgtaaca ttgaataaat cattatttgg aaagatataa gaaacatgta 3960
aatatgcagg aaaagtagtg gtttctctcg tggtgcatcg atttatcgag gagtaacaag 4020
gtacgtataa tccatctaga tatggaacga atactagtgt ttcattattt tttttgatgt 4080
atacataata attgtcatac aatactatta atctaatcta attaatattt cctttaaaat 4140
ggttccaaaa ggcatcacca acatggaagg tggcaagcta ggatcggaag agtcgccggt 4200
aacaaagacc tctacttggg aactttcggt acattttcca ataaaatcta tatactataa 4260
gatattaaat atacacaaat atatctaagt gaatcataca aattatgtag gcacacagga 4320
agaggctgct gaggcttatg acattgcagc cattaaattc agaggattaa gcgcagtgac 4380
taacttcgac atgaacagat acaatgttaa agcaatcctc gagagcccga gtctacctat 4440

```
tggtagttct gcgaaacgtc tcaaggacgt taacaatccg gttccagcta tgatgattag 4500
taataacgtt tcagagagtg caaataatgt tagcggttgg caaaacactg cgtttcagca 4560
tcatcaggga atggatttga gcttattgca gcaacagcag gagaggtacg ttggttatta 4620
caatggagga aacttgtcta ccgagagtac tagggtttgt ttcaaacaag aggaggaaca 4680
acaacacttc ttgagaaact cgccgagtca catgactaat gttgatcatc atagctcgac 4740
ctctgatgat tctgttaccg tttgtggaaa tgttgttagt tatggtggtt atcaaggatt 4800
cgcaatccct gttggaacat cggttaatta cgatcccttt actgctgctg agattgctta 4860
caacgcaaga aatcattatt actatgctca gcatcagcaa caacagcaga ttcagcagtc 4920
gccgggagga gattttccgg tggcgatttc gaataaccat agctctaaca tgtactttca 4980
cggggaaggt ggtggagaag gggctccaac gttttcagtt tggaacgaca cttagaaaaa 5040
taagtaaaag atcttttagt tgtttgcttt gtatgttgcg aacagtttga ttctgttttt 5100
ctttttcctt tttttgggta attttcttat aacttttttc atagtttcga t          5151
```

<210> 7
<211> 581
<212> PRT
<213> Arabidopsis thaliana

<400> 7

```
Met Asn Asn Trp Leu Gly Phe Ser Leu Ser Pro His Asp Gln Asn His
 1               5                  10                  15

His Arg Thr Asp Val Asp Ser Ser Thr Thr Arg Thr Ala Val Asp Val
            20                  25                  30

Ala Gly Gly Tyr Cys Phe Asp Leu Ala Ala Pro Ser Asp Glu Ser Ser
        35                  40                  45

Ala Val Gln Thr Ser Phe Leu Ser Pro Phe Gly Val Thr Leu Glu Ala
    50                  55                  60

Phe Thr Arg Asp Asn Asn Ser His Ser Arg Asp Trp Asp Ile Asn Gly
65                  70                  75                  80

Gly Ala Cys Asn Thr Leu Thr Asn Asn Glu Gln Asn Gly Pro Lys Leu
                85                  90                  95

Glu Asn Phe Leu Gly Arg Thr Thr Thr Ile Tyr Asn Thr Asn Glu Thr
            100                 105                 110

Val Val Asp Gly Asn Gly Asp Cys Gly Gly Gly Asp Gly Gly Gly Gly
        115                 120                 125

Gly Ser Leu Gly Leu Ser Met Ile Lys Thr Trp Leu Ser Asn His Ser
    130                 135                 140

Val Ala Asn Ala Asn His Gln Asp Asn Gly Asn Gly Ala Arg Gly Leu
145                 150                 155                 160

Ser Leu Ser Met Asn Ser Ser Thr Ser Asp Ser Asn Asn Tyr Asn Asn
                165                 170                 175

Asn Asp Asp Val Val Gln Glu Lys Thr Ile Val Asp Val Val Glu Thr
            180                 185                 190

Thr Pro Lys Lys Thr Ile Glu Ser Phe Gly Gln Arg Thr Ser Ile Tyr
        195                 200                 205

Arg Gly Val Thr Arg His Arg Trp Thr Gly Arg Tyr Glu Ala His Leu
    210                 215                 220

Trp Asp Asn Ser Cys Lys Arg Glu Gly Gln Thr Arg Lys Gly Arg Gln
225                 230                 235                 240

Val Tyr Leu Gly Gly Tyr Asp Lys Glu Glu Lys Ala Ala Arg Ala Tyr
```

```
                245                 250                 255

Asp Leu Ala Ala Leu Lys Tyr Trp Gly Pro Thr Thr Thr Thr Asn Phe
            260                 265                 270

Pro Leu Ser Glu Tyr Glu Lys Glu Val Glu Glu Met Lys His Met Thr
        275                 280                 285

Arg Gln Glu Tyr Val Ala Ser Leu Arg Arg Lys Ser Ser Gly Phe Ser
    290                 295                 300

Arg Gly Ala Ser Ile Tyr Arg Gly Val Thr Arg His His Gln His Gly
305                 310                 315                 320

Arg Trp Gln Ala Arg Ile Gly Arg Val Ala Gly Asn Lys Asp Leu Tyr
                325                 330                 335

Leu Gly Thr Phe Gly Thr Gln Glu Glu Ala Ala Glu Ala Tyr Asp Ile
            340                 345                 350

Ala Ala Ile Lys Phe Arg Gly Leu Ser Ala Val Thr Asn Phe Asp Met
        355                 360                 365

Asn Arg Tyr Asn Val Lys Ala Ile Leu Glu Ser Pro Ser Leu Pro Ile
    370                 375                 380

Gly Ser Ser Ala Lys Arg Leu Lys Asp Val Asn Asn Pro Val Pro Ala
385                 390                 395                 400

Met Met Ile Ser Asn Asn Val Ser Glu Ser Ala Asn Asn Val Ser Gly
                405                 410                 415

Trp Gln Asn Thr Ala Phe Gln His His Gln Gly Met Asp Leu Ser Leu
            420                 425                 430

Leu Gln Gln Gln Gln Glu Arg Tyr Val Gly Tyr Tyr Asn Gly Gly Asn
        435                 440                 445

Leu Ser Thr Glu Ser Thr Arg Val Cys Phe Lys Gln Glu Glu Glu Gln
    450                 455                 460

Gln His Phe Leu Arg Asn Ser Pro Ser His Met Thr Asn Val Asp His
465                 470                 475                 480

His Ser Ser Thr Ser Asp Asp Ser Val Thr Val Cys Gly Asn Val Val
                485                 490                 495

Ser Tyr Gly Gly Tyr Gln Gly Phe Ala Ile Pro Val Gly Thr Ser Val
            500                 505                 510

Asn Tyr Asp Pro Phe Thr Ala Ala Glu Ile Ala Tyr Asn Ala Arg Asn
        515                 520                 525

His Tyr Tyr Tyr Ala Gln His Gln Gln Gln Gln Gln Ile Gln Gln Ser
    530                 535                 540

Pro Gly Gly Asp Phe Pro Val Ala Ile Ser Asn Asn His Ser Ser Asn
545                 550                 555                 560

Met Tyr Phe His Gly Glu Gly Gly Gly Glu Gly Ala Pro Thr Phe Ser
                565                 570                 575

Val Trp Asn Asp Thr
            580
```

<210> 8
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 8
gaggcagcgg tcggatcgta acagtactct 30

<210> 9
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 9
cataaggaga gagagaaaag cctaaccagt 30

<210> 10
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 10
accaagaact cgttagatc 19

<210> 11
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 11
aacgcatata actaaagatc 20

<210> 12
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 12
ccatggatcc agagacgaag cgaaac 26

<210> 13
<211> 26
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 13
actccatgga taataactgg ttaggc 26

<210> 14
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Primer

<400> 14
aaattctcaa gctttggtcc atcttg 26